National Vegetation Classification System Standard Operating Procedure

Original Document: December 12, 2003
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Introduction: The National Vegetation Classification System (NVCS) is a national standard for identifying ecosystem communities of vegetation. All National Wildlife Refuges must classify to formation level. Since Big Muddy NFWR received federal funding specifically for mat vegetation it is responsible for classifying to the alliance level. This document identifies procedures for post processing of data to develop a classification system for the refuge.

1. Areas that were to be researched were broken down into categories of vegetation type using 2000 aerial photographs and Arc View 3.2. These include early successional forest, mature forest, and herbaceous prairie. Once these polygons were digitized on aerial photos, MN DNR Random Point Generator Extension 2.0 generated points within each polygon. These points were 100 m from the edge of the polygon and 250 m from every other point. Vegetation analysis and classification was performed at each point (Standardized Bottomland Hardwood Forest Data Collection).

2. Once data from each point was entered, the data for each polygon was combined for each layer of vegetation (upper canopy, mid canopy, shrub layer, ground layer) of that polygon in Microsoft Excel® (\\Big-muddy-05xp\sharedfiles\nvcs\VEG STUFF). An average composition was found for each species. This is easily done by entering each point's species composition into a Microsoft Excel® spreadsheet. When all points for that polygon and layer are entered, an average was calculated in excel. (Table 1). This should be done for all layers within the polygon.

    Table 1. Example of the upper canopy of a polygon with species and their percent composition for each point. The points were then averaged to find the percent composition of each species for that polygon.

UPPER	JAM50	JAM51	JAM53		AVG.
PODED	80	70		150	50.0%
SANI	15	30	95	140	46.7%
SAIN3	5			5	1.7%
ACNEN			5	5	1.7%

3. Once all percentages are found for each layer of each polygon, the National Vegetation Classification Standard can be applied. This classification system uses Division/Order, Class, Subclass, Group, Subgroup, and Formation (Federal Geographic Data Committee Vegetation Subcommittee). For each polygon the classifications need to be identified. These classifications are defined at http://www.fgdc.gov/standards/documents/standards/vegetation/tables19-41.pdf on the Federal Geographic Data Committee Vegetation Subcommittee homepage (Check Appendix for office locations of classification system).

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4. Once formation level has been identified for each polygon, alliances and associations may be applied. These are found at http://www.natureserve.org/explorer/. At this webpage, connect to the *ecological communities* link. This page lets you search for associations and alliances by name, location, or status. Click on the *location* tab, check the box for *Missouri* and hit the *search now* box. A database of associations and Alliances for Missouri will show up. These associations and alliances can than be matched with each polygon (Check Appendix for office locations of alliance and associations).

5. After all classifications have been made, make a matrix to easily show the classification levels of each polygon. This can be done in Microsoft Excel® or a similar program. An example of a polygon's classification can be found in Table 2.

Table 2. Matrix made in Microsoft Excel® showing the classification of each level for the polygon consisting of points JAM 43-45 (\\Big-muddy-05xp\sharedfiles\nvcs\matrix).

	DIVISION	CLASS	SUBCLASS	GROUP	SUBGROUP
JAM 43-45	Tree Dominated	Closed Tree Canopy	Deciduous Closed Tree Canopy	Cold-Deciduous Closed Tree Canopy	Natural/Semi-Natural

FORMATION	ALLIANCE	ASSOCIATION
Lowland or submontane cold-deciduous closed tree canopy	Acer negundo Temporarily Flooded Forest Alliance	Acer negundo Forest

Table 3. "The USNVC's Physiognomic-floristic Hierarchy for Terrestrial Vegetation" (Grossman et al. 1998). Provides a summary and an example of the terrestrial classification hierarchy.

Level	Primary Basis for Classification	Example
Class	Growth form and structure of vegetation	Closed Tree Canopy
Subclass	Growth form characteristics, e.g., leaf phenology	Deciduous Closed Tree Canopy
Group	Leaf types, corresponding to climate	Cold-Deciduous Closed Tree Canopy
Subgroup	Relative human impact (natural/semi-natural, or cultural)	Natural/Semi-Natural
Formation	Additional physiognomic and environmental factors, including hydrology	Lowland or Submontane Cold-Deciduous Closed Tree Canopy
Alliance	Dominant/diagnostic species of uppermost or dominant stratum	Acer negundo Temporarily Flooded Forest Alliance
Association	Additional dominant/diagnostic species from any strata	Acer negundo Forest

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References

Federal Geographic Data Committee Vegetation Subcommittee. June 1997. National Vegetation Classification System FGDC-STD-005. http://www.fgdc.gov/standards/documents/standards/vegetation/tables19-41.pdf.

Grossman, D. H., D. Faber-Langendoen, A. S. Weakley, M. Anderson, P. Bourgeron, R. Crawford, K. Goodin, S. Landaal, K. Metzler, K. D. Patterson, M. Pyne, M. Reid, and L. Sneddon. 1998, International classification of ecological communities: terrestrial vegetation of the United States. Volume 1. The National Vegetation Classification System: developments, status, and application. The Nature Conservancy, Arlington, Virginia, USA.

Nature Serve Explorer. An online encyclopedia of life. http://www.natureserve.org/explorer/.

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APPENDIX
Location References of association and alliance levels within the office of Big Muddy National Fish and Wildlife Refuge

	Room	Book/Binder	Title
Classification System (#3)	Refuge Biology #9	National Vegetation Classification System (NVCS)	Vegetation Classification Standard
Associations and Alliances for Missouri	Refuge Biologist #9	National Vegetation Classification System (NVCS)	Associations & Alliances
Associations and Alliances for Missouri	Refuge Biologist #9	National Vegetation Classification System (NVCS)	Plant Communities of Midwest – Missouri Subset